

This Excel spreadsheet calculates solid fuel appliance efficiency and heat output in accordance with the procedure specified in CSA B415.1-10. In general the column headings correspond to the variables used in the Standard.

All data from a test run are entered on the "Data" sheet. The cells requiring data entry are highlighted. Please note that input data can be entered in either yard/pound or SI units. Select the units in cells F4 and F5 of the "Data" sheet.

Particulate emissions determined using the dilution tunnel method should be entered in cell C13 of the "Data" sheet as total grams of emissions.

Since oxygen concentrations are calculated for the efficiency determination, entry of measured oxygen data is optional. However, it might be useful to include the measured oxygen values for comparison to the calculated values for diagnostic purposes. A deviation of more than 1 or 2 percentage points can indicate inaccurate CO, CO₂, or fuel composition input data.

Selection of an appliance type in cell F2 of the "Data" sheet is needed for the air/fuel ratio calculation in accordance with Clause 16.3.5 of the Standard.

The "CSA B415.1 Calculations" and "Report" sheets include calculation of efficiencies based on the Lower Heating Value (LHV) of the fuel, which is not required in CSA B415.1-10. The LHV is calculated from the Higher Heating Value (HHV) and fuel composition data in accordance with ASTM E711.

The "CSA B415.1 Calculations" sheet is locked and password protected to prevent inadvertent modifications.

The "Chart" sheet includes a chart of flue gas composition data and fuel consumption. The range of cells in the "CSA B415.1 Calculations" sheet to be charted or plotted might need to be adjusted to correspond to the number of data points entered.

Please report any errors or problems to Tony Joseph at CSA.

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197	0.63	0.54	4.6	332.21	62.39
198	0.68	0.54	4.6	296.37	52.30
199	0.62	0.54	4.6	296.96	62.38
200	0.91	0.53	4.7	224.9	62.39
201	0.95	0.53	4.6	254.13	83
202	1.00	0.53	4.5	245	83
203	0.82	0.53	4.5	326.22	52.32
204	0.84	0.53	4.4	334.14	62.34
205	0.50	0.54	4.4	259.70	52.34
206	0.75	0.55	4.4	387.51	62.33
207	0.53	0.55	4.4	296.55	62.23
208	0.54	0.54	4.4	293.56	62.23
209	0.00	0.56	4.5	259.82	62.23

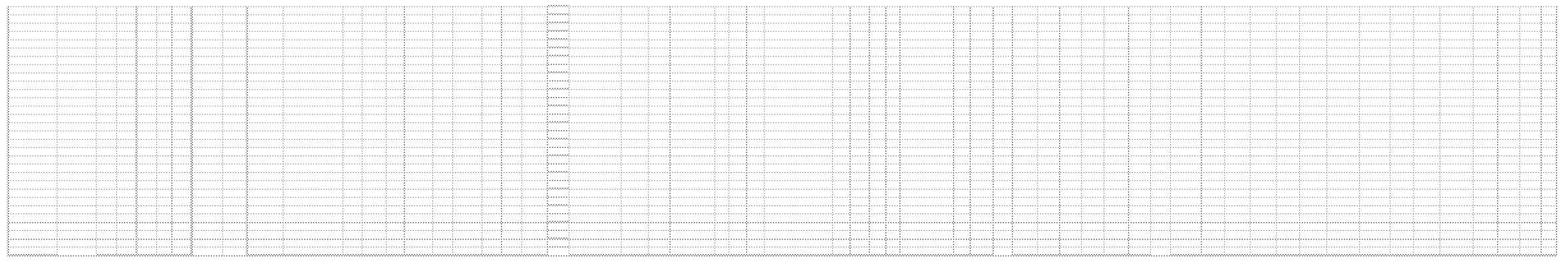
Manufacturer:	CPI	Model:	CPI	Date:	09/25/29	Overall Heating Efficiency:	99.75%	AF Fuel Rate (AFH):	10.00	Moisture of Wood (mbasisia):	21.2	Dry kg:	12.23
Run:	1	Code for Fireplaces - Type "C", "G", "P", "P/P", "P/P/P", and "Mass" Boiler	ASME Boiler and Pressure Vessel Code	Combustion Efficiency:	95.91%	Heat Input (Btu):	210,000 Btu/hour	Net AF Fuel Rate (AFH):	10.00	Total (kg/h):	243,212	230,770 (kg) (86%)	12.25
Contract#:		columns (1), (2), (3), (4), (5), (6), (7), (8), (9), (10), (11), (12), (13)	Heat Transfer Efficiency:	73.45%	Heat Output (AF):	10.00	Efficiency:	95.81%	Moisture Content (Dry):	169,788	161,096 (kg) (86%)	28.90	
Test Duration:	269	Rows 1-10: Test Data; Rows 11-13: Calculated Results	in Minutes (3.75 to 15.75)	Eff:	99.75%	Heat Input:	68,261 Btu/h	Efficiency:	95.81%	Total (CO (g):	88444		
				BF:	95.65% / 95.65%	Heat Output:	48,230 Btu/h	Efficiency:	95.81%				
				Comb BF:	95.65% / 95.65%	Heat Input:	68,261 Btu/h	Efficiency:	95.81%				
				AF/EW:	95.45% / 95.51%	Burn Duration:	3.48	Efficiency:	95.81%				
				Output:	42,453 KJ/h	Burn Rate:	7.74 Btu	Efficiency:	95.81%				
				StartRate:	3.53 KJ/h	Efficiency:	95.81%	Efficiency:	95.81%				
				StopRate:	3.53 KJ/h	Efficiency:	95.81%	Efficiency:	95.81%				
				Start CO:	3.54 g	Efficiency:	95.81%	Efficiency:	95.81%				
				Stop CO:	3.54 g	Efficiency:	95.81%	Efficiency:	95.81%				











CS

Manufacturer: CF1
Model: CF1
Date: 09/25/29
Run: 1
Control #:
Test Duration: 209
Output Category: lv

Technicians: Kelli O'Brien

Test Results in Accordance with CSA B415.1-10

	HHV Basis	LHV Basis
Overall Efficiency	69.8%	75.2%
Combustion Efficiency	95.0%	95.0%
Heat Transfer Efficiency	73%	79.1%

Output Rate (kJ/h)	48,743	46,238	(Btu/h)
Burn Rate (kg/h)	3.51	7.74	(lb/h)
Input (kJ/h)	69,850	66,261	(Btu/h)

Test Load Weight (dry kg)	12.23	26.97	dry lb
MC wet (%)	21.2		
MC dry (%)	26.90		
Particulate (g)	0		
CO (g)	884		
Test Duration (h)	3.48		

Emissions	Particulate	CO
g/MJ Output	0.00	5.21
g/kg Dry Fuel	0.00	72.29
g/h	0.00	253.91
Ib/MM Btu Output	0.00	12.11

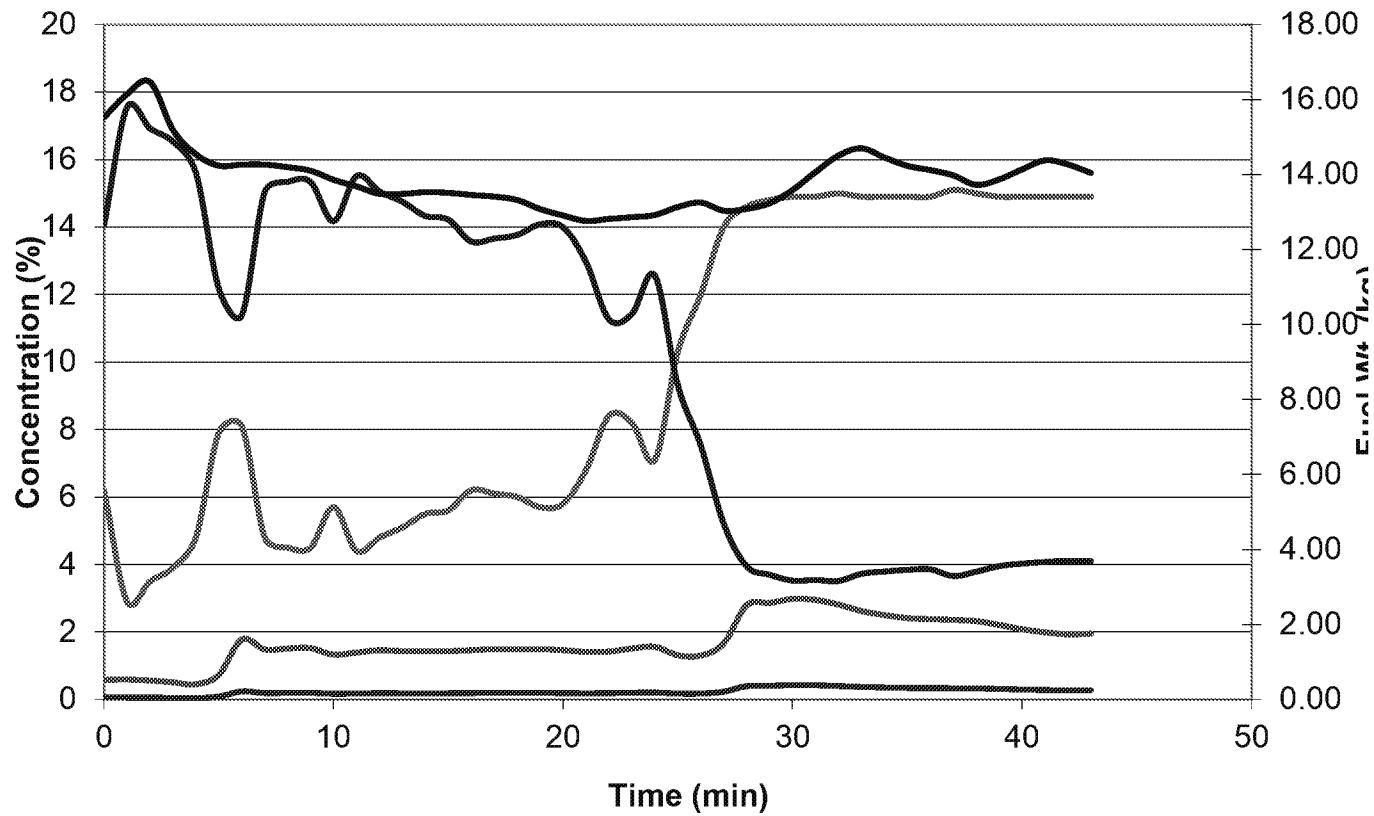
Air/Fuel Ratio (A/F)	10.29
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VERSION:

2.4

4/15/2010

Run: 1



- CO [e]
- CO₂ [d]
- CH₄ [k]
- O₂ Calc. [g]
- Weight

Note: In the legend, [d], [e], [g], and [k] refer to their respective variables in Clauses 13.7.3 and 13.7.5